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Outlook

SPRING 2010

 Washington
University in St. Louis
SCHOOL OF MEDICINE

Brain power

Understanding and
harnessing its hidden energy

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OUTLOOK • SPRING 2010

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Hats off! A knitting club comprising 45 faculty and staff from Washington University Medical Center and the university's Danforth Campus meets weekly to share their enjoyment of the craft and to trade techniques. This spring, the group donated the knit hats shown here for premature babies at St. Louis Children's Hospital and cancer patients at Barnes-Jewish Hospital. Plans are under way for a new project that will culminate in donation to another worthy cause in the fall. Below, some of the club's members show off their colorful creations.



Outlook

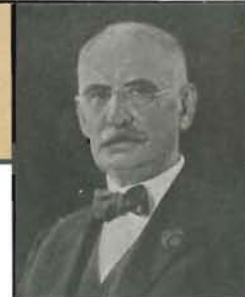
A continuing need for scholarship support

Turn this card for the inspiring story
of a generous legacy that still helps
students at the School of Medicine.



*Support for today's students
means a future of beneficial care
and scientific breakthroughs.*

See page 36



Jackson Johnson

His generosity lives on

"Under the will of the late Jackson Johnson, the sum of \$250,000 was donated to the School of Medicine, the income of which is to be used to aid worthy and desirable students in acquiring and completing their medical education."


With this brief item in the 1930 Washington University School of Medicine *Bulletin*, so began the endowed Jackson Johnson Scholarship Fund.

Jackson Johnson was president of International Shoe Company, the largest shoe manufacturer in the country early in the 20th century. He was elected to the Washington University Board of Trustees in 1919 and served until his death in 1929. He endowed the Jackson Johnson Scholarship Fund in memory of his son, Jackson Johnson Jr., who lost his life in "the Service of the United States during the Great War."

Coming during the Great Depression, these resources were critical in making it possible for aspiring young students to pursue their medical educations. And for over 70 years, this scholarship fund has continued to do just that. Since its inception, more than 700 young men and women have received about \$1 million in financial assistance.

To maintain its reputation for excellence, Washington University School of Medicine must continue to attract the most promising and best qualified students. Many of these exceptional students will require financial assistance, and the need for scholarship support is growing faster than available resources can sustain.

**To learn more about how you can
make an impact, please contact the
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Outlook

Washington University School of Medicine
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Safe & Sound

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The 24/7 Brain

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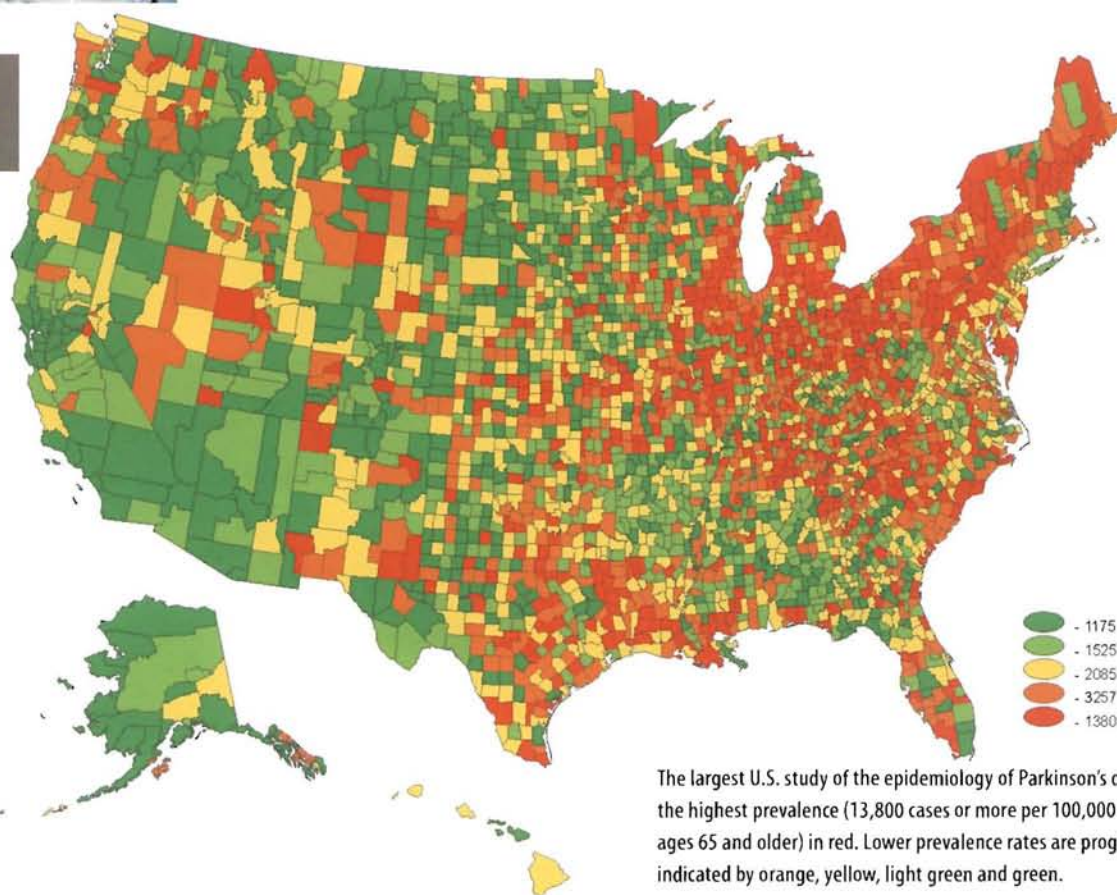
COVER Marcus E. Raichle, MD, professor of radiology, neurobiology and neurology, contemplates the "dark energy" of the brain. To learn more about how Raichle and his colleagues are using this new understanding of the brain to analyze its organization, please turn to page 16.

PHOTO BY ROBERT BOSTON

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30 Altruistic survivor



The largest U.S. study of the epidemiology of Parkinson's disease shows the highest prevalence (13,800 cases or more per 100,000 residents ages 65 and older) in red. Lower prevalence rates are progressively indicated by orange, yellow, light green and green.

NEUROEPIDEMIOLOGY, MARCH 2006

Parkinson's profile

Why are certain races, regions hardest hit by the disease?

The largest epidemiological study of Parkinson's disease in the United States has found the disease is more common in the Midwest and the Northeast and is twice as likely to strike whites and Hispanics as blacks and Asians.

The study, based on data from 36 million Medicare recipients, is the first to produce any significant information on patterns of Parkinson's disease in minorities and to show geographic clusters for the condition.

"Finding clusters in the Midwest and the Northeast is particularly exciting," says lead author Allison Wright Willis, MD, assistant professor of neurology. "These are the two regions of the country most involved in metal processing and agriculture, and chemicals used in these fields are the strongest potential environmental risk factors for Parkinson's that we've identified so far."

The results appear online in the journal *Neuroepidemiology*.

Parkinson's disease is a common neurodegenerative condition that causes tremor,

stiffness, slowness, mood and behavioral disorders, sleep problems and other symptoms. The disease is characterized by the loss of dopamine, a compound involved in communication between brain cells.

According to Willis, genetic factors explain only a small percent of cases. Environmental factors are likely more

Genetic factors explain only a small percent of cases. Environmental factors are likely more common contributors.

common contributors and may include prolonged exposures to herbicides and insecticides used in farming or to make metals such as copper, manganese and lead.

For the new study, Willis analyzed data on more than 450,000 cases of Parkinson's disease per year over six years, 1995 and 2000–05. Collectively, that data included information from more than 98 percent of all Americans 65 and older.

She found Asians and blacks developed Parkinson's disease at half the rate of whites and Hispanics.

"We are going to try to learn more about why this is the case," Willis says. "It could be that those with Asian or African ancestry have genes that help protect them from exposure to environmental factors that cause Parkinson's disease, or they may have fewer exposures to those factors."

Epidemiologists have long debated whether Parkinson's disease is more prevalent in rural or urban areas, and studies have shown contradictory results. Willis found the condition to be more common in urban areas, but concluded the comparison between urban and rural rates offered little potential for insight into the disease.

"Urban and rural are defined in many different and relatively arbitrary ways," says Willis. "We came away convinced by our results that these distinctions have little to do with what is causing Parkinson's."

She and her colleagues plan further studies of how exposure to environmental factors influences disease risk.

"This was the largest descriptive epidemiological study yet to be conducted of Parkinson's disease in the United States, and it has given us some interesting new leads for future research," Willis says.

Expediting data for research on brain, central nervous system

NIH grant funds brain imaging center

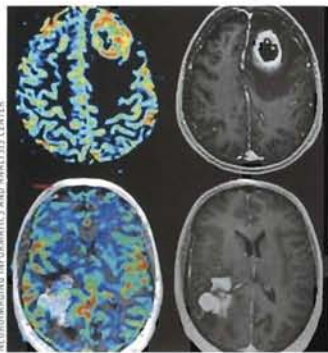
Researchers at the School of Medicine have received a five-year, \$3.8 million grant from the National Institute of Neurological Disorders and Stroke for a center that helps researchers collect and use data on the brain and central nervous system.

The Neuroimaging Informatics and Analysis Center (NIAC) supports Washington University scientists whose research involves brain and central nervous system imaging, according to associate director Daniel S. Marcus, PhD, research assistant professor of radiology at the university's Mallinckrodt Institute of Radiology.

"Scans of the brain and other central nervous system structures can get computationally intensive," Marcus says. "The analysis of structural brain data on a single patient, for example, consumes significant computing time, and some studies involve scans of a thousand subjects or more.

"We're here to support the storage, processing and analysis of that data," he says.

As an example of such data-intensive studies, Marcus says that Alzheimer's researchers working to understand the disorder's effects on the brain and develop better diagnostic techniques often need to conduct detailed analyses of multiple brain regions.



New techniques to analyze data about the brain: Scans of patients with tumors known as glioblastomas.

Directed by Mark A. Mintun, MD, vice chair for research in radiology and professor of radiology, neurobiology and psychiatry, the NIAC comprises three cores: informatics, data analysis and administrative/educational.

The informatics core runs an imaging database, the Central Neuroimaging Data Archive, that includes data from both research scanners in radiology and clinical scanning data from Barnes-Jewish Hospital. Included are scanning results and other potentially relevant data on subjects such as demographics and clinical outcomes, with personal identification data removed to protect patient privacy.

NIAC's data analysis core researches, refines and applies the latest approaches for transforming the scanner results into information that can be used for medical research.

In addition to running the NIAC, the administrative core supports educational programs, including a seminar series, tutorials and training programs.



A century of care Philip R. Dodge, MD, one of the founders of pediatric neurology and head of the Department of Pediatrics at the School of Medicine for 21 years, examines a young patient. The Department of Pediatrics celebrates its first 100 years in 2010. Currently ranked ninth in the nation by *U.S. News & World Report*, it has become a world leader in pediatric patient care, teaching and research with its many groundbreaking discoveries and for its excellence in all divisions. To learn more about its history, please visit peds.wustl.edu.

Three medical faculty named to AAAS

Three School of Medicine faculty members have been named fellows of the American Association for the Advancement of Science (AAAS), the world's largest general scientific society. The highest honor awarded by AAAS, the rank of fellow is bestowed upon members by their peers in recognition of scientifically or socially distinguished efforts to advance science or its applications.

Scott J. Hultgren, PhD, the Helen L. Stoeber Professor of Molecular Microbiology and director of the Center for Women's Infectious Disease Research, was elected to the Section on Medical Sciences for distinguished contributions based on a multidisciplinary approach to identify virulence factors in the pathogenesis of uropathogenic *E. coli*. These studies are leading to new and better treatments and clinical diagnoses for urinary tract infections.

Andrey S. Shaw, MD, the Unanue Distinguished Professor of Immunobiology and a Howard Hughes Medical Institute Investigator in Pathology and Immunology, was elected to the Section on Biological Sciences for distinguished contributions to the field of immunology, particularly for studies of signaling in T-cells.

Wayne M. Yokoyama, MD, the Sam J. and Audrey Loew Levin Professor of Arthritis Research, professor of medicine, a Howard Hughes Medical Institute investigator and director of the Medical Scientist Training Program, was elected to the Section on Medical Sciences for distinguished contributions in characterizing natural killer (NK) cell receptors and their functions.

AAAS Fellows

- Scott J. Hultgren, PhD
- Andrey S. Shaw, MD
- Wayne M. Yokoyama, MD



The play's the thing Jason W. Curtis (center, in red tunic), a first-year medical student, rehearses his role as Prince Dauntless in the School of Medicine's production of "Once Upon a Mattress." About 50 MD, MSTP, OT and PT students participated in the fifth annual musical presented in April at the St. Louis College of Pharmacy's Whelpley Auditorium.

Loeb teaching fellows selected

School of Medicine faculty members Michael M. Awad, MD, Joan L. Rosenbaum, MD, and Gladys Tse, MD, have been chosen as recipients of the 2010–12 Carol B. and Jerome T. Loeb Teaching Fellowships.

The fellowship program was established in 2004 by a gift from the Loeb family to advance clinical education and to honor local physicians committed to clinical excellence. Strengthened by a gift from the Barnes-Jewish Hospital Foundation, the program allows the fellows to take time from their regular duties to teach clinical medicine to students and residents.

Loeb Teaching Fellows

- Michael M. Awad, MD
- Joan L. Rosenbaum, MD
- Gladys Tse, MD

easily navigable resource.

Rosenbaum, professor of pediatrics, will develop a curriculum in pediatric palliative care for medical students and residents. The project will incorporate innovative teaching methods and be available to third- and fourth-year medical students and pediatric residents.

Tse, assistant professor in obstetrics and gynecology, plans to implement a structured simulation program to acquire and evaluate basic and advanced surgical skills in obstetrics and gynecology. She also will develop a curriculum for third- and fourth-year medical students that will allow them to get hands-on surgical experience in the simulation center prior to their operating room experience.

Identifying risk and mitigating damage key in pediatric stroke

Focus is on kids' recovery, development

Stroke is commonly thought of as a concern only for older adults, but pediatric strokes annually affect 13 of every 100,000 U.S. children. In the St. Louis area, many of these patients are seen by Washington University specialists at the Pediatric Stroke Center at St. Louis Children's Hospital.

Recognizing pediatric stroke is a challenge for parents and physicians

video feature at:
news.wustl.edu

alike. Symptoms often are more subtle than those of adult patients and can include neck pain, energy loss, unusual behavior and difficulty with speech.

Michael J. Noetzel, MD, director of pediatric and developmental neurology, says pediatric stroke often is associated with other disorders, including sickle cell anemia and viral infections such as chicken pox. But it also occurs in seemingly healthy children. The Pediatric Stroke Center is working to identify risk factors and potential risk reduction strategies.

If pediatric stroke patients are diagnosed and treated promptly, the prognosis for most is good, according to Noetzel. The developing brain of a child has more flexibility to adapt to and recover from injury. However, this also means physicians and parents have to monitor children carefully in the years following a stroke.

"You know exactly what adults were capable of doing prior to the stroke and can monitor them as they hopefully get back to that level," he says. "In pediatric patients, you not only want them to recover what they could do before, you also want them to continue maturing and developing."

Kharasch to head research enterprise

Evan D. Kharasch, MD, PhD, the Russell D. and Mary B. Shelden Professor of Anesthesiology and professor of biochemistry and molecular biophysics, has been appointed vice chancellor for research. He had served as interim vice chancellor since July 2009.

"It has been a privilege and a pleasure to have served the university on an interim basis for the last several months," Kharasch says. "The experience of working with the faculty, department heads, deans and senior university leadership as well as the outstanding and dedicated team of individuals in the Office of the Vice Chancellor for Research solidified my interest in continuing in the permanent position to foster innovation and excellence in our research endeavors."



Evan D. Kharasch, MD, PhD



Smoke and mirrors

Robert K. Jackler, MD, center, the Sewall Professor and chair of otolaryngology and associate dean at Stanford University School of Medicine, talks with second-year medical students Andrew Y. Lee and Elizabeth A. Davlantes about some of the ads in his exhibit, "Not a Cough in a Carload: The Campaign by the Tobacco Industry to Hide the Hazards of Smoking." Jackler visited the School of Medicine in March to open the exhibit at the Farrell Learning and Teaching Center and Becker Medical Library and to speak at the Department of Otolaryngology Grand Rounds. To view more ads and vintage videos, please visit: <http://news.wustl.edu/news/Pages/20334.aspx>.



CELL BIOLOGY AND PHYSIOLOGY

New breast cancer subtype responds to drug

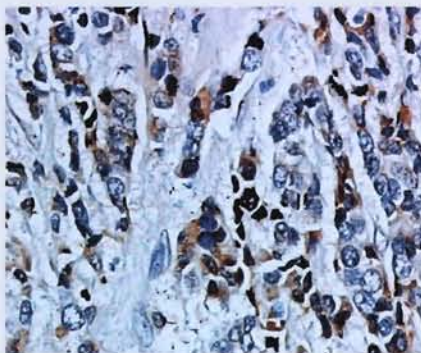
A newly identified cancer biomarker could define a new subtype of breast cancer as well as offer a potential way to treat it, say researchers at the School of Medicine.

The finding could further refine what recent breast cancer research has concluded: that breast cancer is not one disease, but many. So far, research has firmly established that at least five subtypes of breast cancer exist, each having distinct biological features, clinical outcomes and responses to traditional therapies.

The biomarker identified by the researchers is found frequently in breast cancers and especially in those that have poorer outcomes. It stems from overactivation of a gene called LRP6 (low-density lipoprotein receptor-related protein 6), which stimulates an important cell-growth signaling pathway.

LRP6 can be inhibited by a protein discovered in the same laboratory, and this protein could become an effective drug against the breast cancer type, the researchers say.

"We found increased expression of the LRP6 gene in about a quarter of breast cancer specimens we examined, and we think LRP6 overexpression could be a marker for a new class of breast cancer," says Guojun Bu, PhD, professor of pediatrics and of cell biology and physiology. "In addition, we found that this biomarker is often associated with breast cancers that are either harder to treat or more likely to recur. We already have an



Human breast cancer tissue in which the biomarker LRP6 is stained brown.

agent that seems to be effective against LRP6-overexpressing tumors, which could someday become a therapy for tumors that currently have few treatment options."

The research was conducted primarily by Chia-Chen Liu, a graduate student in the Bu lab who is a fellow in the Cancer Biology Pathway Program at the Alvin J. Siteman Cancer Center at Barnes-Jewish Hospital and Washington University School of Medicine. The findings were published in the March 1 online early edition issue of the *Proceedings of the National Academy of Sciences*.

The researchers' analysis of human breast cancer tissue samples found significant increases in LRP6 levels in 20 percent to 36 percent of the tumors. Research in the lab had earlier discovered a protein that binds to and inhibits LRP6. This study showed that the protein, called Mesd (mesoderm development), was able to slow the growth of breast cancer cells in the laboratory and to inhibit mammary tumor growth in laboratory mice.



MICHAEL WORTZ

Job search Jessica R. Dahms, second from right, and Justin A. Barber, right, second-year students in the Program in Occupational Therapy, talk with recruiters from Cincinnati Children's Hospital at the occupational therapy/physical therapy job fair held in February at the Farrell Learning and Teaching Center. Due to the high demand for therapists in both fields and the reputation of both programs, nearly all of the School of Medicine's Program in Occupational Therapy and Program in Physical Therapy graduates actively seeking employment find jobs within three months of graduating.

Neurological care for NFL players

Washington University neurologists at Barnes-Jewish Hospital will be part of a new neurological care program for retired professional football players, the National Football League and NFL Alumni Association announced earlier this spring.

The program, one of a series of NFL initiatives addressing the quality of life of retired players, makes available neurological specialists at five leading medical centers nationwide, including Washington University School of Medicine, to evaluate and treat possible neurological conditions. Each

center will provide a team of specialists led by a neurologist who will serve as program director. David L. Brody, MD, PhD, assistant professor of neurology, will direct the St. Louis branch.

"We're honored that the NFL selected us to participate and hope it will be an opportunity for us to contribute to a greater understanding of the aftereffects of repetitive concussive brain injuries and how best to treat them," Brody says. "We also hope that this initiative will raise public awareness of traumatic brain injury and the need for treatment and rehabilitation."

Staff for the St. Louis care program will include Brody, five other medical faculty members and two administrators.

The other participating centers are: Morehouse School of Medicine in Atlanta, Mount Sinai in New York City, Doctors of USC in Los Angeles, and the University of California, San Francisco, School of Medicine.



David L. Brody, MD, PhD

Promoting a comprehensive approach to childhood obesity

All sectors of society need to play role

During the past three decades, the childhood obesity rate has more than doubled. Extra pounds put kids at risk of developing medical conditions formerly associated with adults, such as type 2 diabetes, high blood pressure and high cholesterol.

"This is the first generation that may not outlive its parents," says Debra L. Haire-Joshu, PhD, professor and associate dean for research at the George Warren Brown School of Social Work at Washington University in St. Louis and faculty scholar in the Institute for Public Health.

To combat this health epidemic in children, obesity researcher Haire-Joshu says parents, schools and communities have to be involved. "There are multiple and complex causes of childhood obesity, which will require a comprehensive approach and solution," says Haire-Joshu, also a professor of medicine at the School of Medicine. "We need to create an environment where it's easy to be healthy. For example, we need to promote access to healthy foods and physical education in schools and provide an environment that encourages activity by building sidewalks and bike lanes in our communities."

A healthy environment can prevent obesity.



Recently, Haire-Joshu worked closely with the U.S. Department of Health and Human Services (HHS) in framing policy priorities to battle childhood obesity. These priorities helped shape recommendations by HHS to the Office of First Lady Michelle Obama during development of her campaign, Let's Move. This campaign is designed to reverse the trend of childhood obesity within a generation.

In this effort, the federal government is working with local officials and leaders in business and nonprofit sectors to provide more nutritious food in schools, find more opportunities for children to be physically active, and give more communities access to affordable, healthful food.

Haire-Joshu also says it's important for pediatricians to track children's body mass index and talk to parents about ways to battle obesity, another component of Let's Move.

"We went through structural changes in our society that encouraged overeating and sedentary activity, and now we need to flip back," Haire-Joshu says. "Parents need to hear simple, clear messages that are communicated regularly. They also need to understand the choices they make for their family today will have a lasting impact on their children's health."



Antibodies grown in genetically engineered *Nicotiana benthamiana* plants (a relative of tobacco, shown here) could fight West Nile virus infection as well as the more conventional and costly versions of the same antibody grown in mammalian cells.

QIANG CHEN, PhD

MOLECULAR MICROBIOLOGY AND IMMUNOLOGY

Economical, effective infection fighters

The first head-to-head comparison of therapeutic monoclonal antibodies produced from plants versus the same antibodies produced from mammalian cells shows plant-produced antibodies can fight infection equally well.

Scientists from the School of Medicine and Arizona State University conducted the comparison as a test of the potential for treating disease in developing nations with the significantly less expensive plant-based production technique. The results are reported online in the *Proceedings of the National Academy of Sciences*.

Antibodies, which are part of the immune system, bind to foreign invaders to disable them and label them for destruction. Scientists have developed ways to mass produce and use such monoclonal antibodies; however, the expense of manufacturing the antibodies makes it economically unfeasible to use them to treat disease in the developing world. So, the researchers decided to see whether they could adapt

the West Nile virus monoclonal antibody for production in a much less expensive factory: genetically modified plants.

They adjusted the West Nile virus antibody to adapt it for production in *Nicotiana benthamiana*, a relative of tobacco.

"We altered the genetic coding of the antibody slightly, not changing its parts but using alternate forms of the coding for

Plant-produced monoclonal antibodies may offer affordable solutions for endemic disease.

those parts to maximize the plant's ability to produce it," says co-senior author Qiang Chen, PhD, of Arizona State University. "We also stabilized the antibody, preventing copies of it from being degraded inside the plant cells. Together, those two techniques increased our average antibody yield by 60 percent above any previous efforts."

Scientists then tested regular and plant-produced monoclonal antibodies in mice, both as preventatives against West Nile infection and as treatments for animals already infected with the virus. They found that the antibodies from plants were equally effective at preventing infection and fighting existing infections.

Study co-senior author Michael Diamond, MD, PhD, professor of medicine, molecular microbiology, and pathology and immunology at Washington University, stresses that the study was not designed to make a case for using plant-produced antibodies to treat West Nile virus infections, which continue to occur throughout the United States.

"That's a decision for manufacturers and governmental regulators to make," he says. "Our hope is that once this technology is proven and widely available, it will be taken up by innovative, technology-savvy nations like India and Brazil, where the need for more affordable solutions for endemic diseases is much greater."

Safe & SOUND



Sick infants, life-saving helicopter transports, antibiotics that may cause harm.

A BK-117 HELICOPTER TOUCHES DOWN on the roof of a hospital, its blades still whirling rapidly. A critically ill premature infant is injected with an antibiotic and rushed out to the tarmac in an isolette. The baby waits while the doctor receives last-minute instructions. Then the helicopter is loaded up and lifts off for St. Louis Children's Hospital.

This seems like an ideal way to quickly and safely transport infants at high risk to a hospital better equipped to meet their needs. But one aspect of this scenario had been overlooked until recently: the danger of hearing loss.

BY COLLEEN
COTTON



But, these same drugs might actually protect babies' hearing during their noisy rides.

About 26 million Americans suffer from hearing loss caused by loud noises like jet engines, rotating helicopter blades, or even headphones. Certain antibiotics called aminoglycosides, often applied in the emergency setting, are known to cause hearing loss in some patients by damaging sensory cells of the inner ear. But if you put these two together, is hearing loss worse than either alone?

William W. Clark, PhD, professor of otolaryngology and director of the Program in Audiology and Communication Sciences, a division of CID at Washington University School of Medicine, wanted to find out.

William W. Clark, PhD, conducts an on-site sound test with members of the St. Louis Children's Hospital transport team. A lifelike doll was unfazed during the procedure.



100 decibels

- *Lawn mower*
- *Chainsaw*
- *Helicopter transport*

8 hours' unprotected exposure to this noise level can cause serious hearing damage in adults.

Was this intensity permanently damaging the hearing of infants during their brief journeys to critical medical care?

I was contacted by Mary Jude Weathers, a flight nurse at St. Louis Children's Hospital, who supervised air transport of fragile newborns from remote locations," says Clark.

These infants frequently have a very low birth weight and no immunity to disease. To protect against bacterial infections during transport they often get a dose of an aminoglycoside called gentamicin before being taken from the hospital's sterile environment. As an expert on noise-induced hearing loss, Clark knew that this could be a problem.

"There is good evidence from studies in animals that gentamicin would exacerbate potential noise damage," Clark says. "So it seemed logical to assume that people on gentamicin would be more susceptible to noise-induced hearing loss, and we were especially concerned for these babies."

Weathers and Clark measured noise levels that infants were exposed to during transport. While waiting on the tarmac, the infants experienced sound levels of almost 100 decibels for an average of 12 minutes. This is equivalent to standing next to a running lawn mower or chainsaw without hearing protection. This much noise can cause permanent hearing loss in adults exposed for a few hours, but Clark thought the effect could be much greater in infants with gentamicin in their system.

It was impossible to conduct a clinical study without risking the babies' health. The solution was to turn to the laboratory of Kevin K. Ohlemiller, PhD, research associate professor in otolaryngology, who studies the genetics of hearing loss in mice.

"Both humans and mice are particularly vulnerable to noise- and drug-induced hearing loss at young ages," Ohlemiller says. "The laboratory mouse is a well-established model for human hearing. They possess similar inner-ear anatomy and physiology and similar patterns of age-related, noise-induced and drug-related hearing loss."

Ohlemiller and Clark selected Elizabeth A. Fernandez, then a doctoral student in the Program in Audiology and Communication Sciences (PACS), to structure a research project around this question of hearing loss. The idea was simple: examine how noise, young age and kanamycin (another aminoglycoside like gentamicin) might work together to aggravate hearing loss. Based on previous studies, the researchers fully expected to find dangerous interactions between the different factors.

"At the time, I was doing newborn hearing screenings at Missouri Baptist Hospital, testing babies that were often exposed to gentamicin, Fernandez says. "I was very interested to see if there was a combined effect with these drugs and noise."

Before they began the study, Ohlemiller and Fernandez tried to come up with levels of noise and kanamycin that by themselves would have no effect on young mice, but together might cause hearing loss. They based their initial guesses on data from a strain of mice closely related to the one they had chosen. But eight minutes of noise ended up causing permanent hearing loss. So did four minutes, and two minutes, and one minute. While it was anticipated that young mice would be highly vulnerable to noise, this was an unprecedented level of vulnerability. Ohlemiller was at a loss.

"These mice kept having huge noise-induced hearing losses, much larger than anything the data would have predicted," he says. "When we got down to 30 seconds of noise, we were running out of time and mice. I had Beth begin her study with that interval, which was essentially a guess of mine."

As the data began to come in, it was clear that 30 seconds was still too long; the mice continued to show hearing loss. Ohlemiller worried that his judgment error had threatened the study. But instead of the massive hearing loss expected, animals that received a regular, low dose of kanamycin before noise exposure were fine. Like flipping a switch, kanamycin was fully protective against noise that otherwise would have caused permanent hearing damage. Examination of the mouse inner ears by microscopy showed that kanamycin had protected the sensory cells most often killed by noise.

"The initially unpleasant surprise of Beth's study, that a supposedly safe level of noise caused hearing loss, led to two new discoveries," Ohlemiller says. "First, the strain of mice that we were working with was phenomenally sensitive to noise, more so than I would have ever predicted. And second, a low level of kanamycin was 100 percent effective in protecting against noise-induced hearing loss."

All PACS students must carry out a capstone research project, though the results aren't usually this stunning. Fernandez was able to present her findings at the American Academy of Audiology, where she was one of five recipients of the Student Research Forum Award. The study was published in the Jan. 22, 2010 online edition of the *Journal of the Association for Research in Otolaryngology*.

"I'm a coal miner's daughter, so I have family members with noise-induced hearing loss," says Fernandez. "The goal is to one day have a pharmacologic solution to the problem of noise exposure."

While the scientists stress that their findings do not mean that kanamycin — still an ototoxin —



PACS graduate Elizabeth A. Fernandez, AuD, CCC-A, with her mentor, Kevin K. Ohlemiller, PhD, in his CID laboratory. Fernandez discovered that a low-level dose of the drug kanamycin was 100 percent effective in protecting against noise-induced hearing loss.

should now be used to protect people from noise, their study does show that protective actions of kanamycin may affect outcomes in infants during transport, as well as in other people who are receiving antibiotics and are exposed to noise.

Audiology and Communication Sciences
pacs.wustl.edu

Learning exactly how kanamycin protects the ear's sensory cells could lead to the development of drugs that imitate its effects. Medications that protect the ears from damaging noise are presently missing from the toolbox of clinicians, and they could benefit a wide range of groups, from coal miners to babies. Scientists also can now use the newly recognized "noise sensitive" strain of mice to find genes that may make some humans more vulnerable to noise.

According to Ohlemiller, several new projects are now building on Fernandez' findings. Two are being conducted by PACS students and another will be led by a medical student this summer.

"These results not only energize laboratory scientists and begin new lines of research, they also have implications for clinical practice," Clark says. "This has been an amazing sequence of events, to start a project in a helicopter and end up under a microscope." □



Unprotected control



Protected with kanamycin

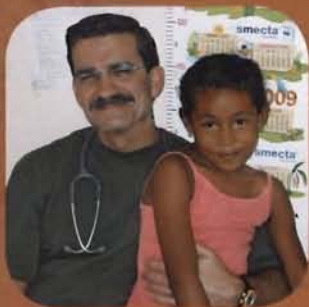
Protection of a mouse cochlea organ of Corti from the effects of noise by kanamycin administration. Several types of cells are missing in the unprotected (saline plus noise) cochlea, but are present in the kanamycin plus noise cochlea.



Physicians' working vacations
help to ease health care
deficiencies a world away

BY GWEN ERICSON

Breath brigade



EACH SPRING for the past nine years, Mario Castro, MD, MPH, has led a brigade to central Honduras: a troop of medical professionals called the Pulmonary and Allergy Brigade, that is. Their five-day mission: to evaluate and treat hundreds of patients with respiratory disorders.

This volunteer group of doctors, nurses and respiratory therapists provides specialized care to Hondurans that local physicians can't, either because they lack the training or because medicine and other supplies are limited.

On their medical aid expeditions, Castro's team has long partnered with teams led by Saint Louis University otolaryngologists Thomas J. Donovan, MD, and John F. Eisenbeis, MD. Recently they were joined by a Washington University team specializing in newborn medicine led by Joan C. Downey, MD, assistant professor of pediatrics, and a group of Washington University heart care specialists led by Victor G. Davila-Roman, MD, professor of medicine in the Cardiovascular Division.

What began as a drop of aid in an ocean of need has created waves with lasting results. The medical teams bring equipment, supplies and medication; they give educational sessions for local physicians; they work with medical students; and they started a medical research project. Not only that, they have helped set in motion construction of a hospital in the district. The new facility, with beds for more than a hundred patients plus surgical and emergency care units, opens this year in June.

Above: Mario Castro, MD, with a Honduran child. Below: Members of the medical aid expedition and the Hospital Santo Hermano Pedro in Catacamas.



"People walk for days to get to our clinic. And they wait for



In addition to providing medical care to patients, the volunteers consult with on-site staff about a variety of issues and offer training seminars.



IN THE RANK of the poorest countries in the Western Hemisphere, Honduras stands third behind Haiti and Nicaragua. Its depressed economic status is reflected in health care characterized by deficiency — in medical specialists and nursing professionals and in facilities, modern medications, functional equipment and basic supplies. This lack is felt especially in the isolated rural areas of the country.

The respiratory health of Hondurans suffers from the effects of widespread air pollution. Across the Honduran countryside, tens of thousands of small fires burn as families prepare meals over simple wood-fueled stoves called fogón or chimenea. The stoves often aren't vented to the outside.

"Families are cooking indoors and heating their houses with firewood, keeping fires going all day," says Castro, professor of medicine in the Division of Pulmonary and Critical Care Medicine and of pediatrics. "Babies and young children are breathing in the smoke and soot. We see kids with runny eyes, nasal irritation and particulate matter coming from their noses. Many of them are wheezing, coughing and short of breath — all common symptoms of asthma, a significant problem in this area."

The Pulmonary and Allergy Brigade is sponsored by the International Medical Assistance Foundation (IMAF) and the Catholic Medical Association. Castro and other St. Louis-area physicians established the IMAF to help support their medical missions to Juticalpa, a town of about 60,000 in central Honduras.

Juticalpa lies in a mountainous region, and the city spreads out in typical old-world fashion, its streets winding haphazardly toward the community's hub containing the town square and a church. Although picturesque, Juticalpa's unpaved streets contribute to lung disorders: older-model vehicles with no emission controls spew exhaust and stir up dust. Moreover, the city has no trash service, so the residents must continually burn their rubbish, adding to the pollution.

"It can be hard to breathe in Juticalpa, and the poor air quality especially affects kids," Castro says. "Nearly two-thirds of the patients we see during our missions are young children, many with severe asthma."

A long line of patients awaits the members of the brigade as soon as they arrive at the Hospital San Francisco, a small state-owned facility on the outskirts of Juticalpa. The patients are referred by local doctors for respiratory problems that can't be treated with medications available in Honduras. By the end of their stay, the team will have seen about 700 patients, funneling them as quickly as possible into and out of cramped clinical quarters.

"People walk for days to get to our clinic," Castro says. "And they wait for hours to see us. We never turn anyone away. We treat people of all ages, and although we primarily treat respiratory conditions, we also end up treating everything from hypertension to headaches, menopause to mites."

hours to see us. We never turn anyone away.” — Mario Castro, MD



PHOTOS COURTESY OF MARIO CASTRO, MD

A typical day with the brigade is chaotic, with five or six patients receiving nebulizer treatments, in which they inhale a mist of medications, while other patients are giving their medical history, getting their vitals taken, having a physical exam, or learning to use new drugs. It's very noisy and very crowded. And that's during the calm hours.

Castro says that nearly every day brings at least one medical emergency. For example, on the first day of the 2007 medical mission, the volunteers were faced with a premature baby in respiratory distress. Luckily, that year, newborn medicine specialist Downey was with the group. She knew how to rig up a system to deliver lightly pressurized oxygen using just an oxygen tank and supplies you can pick up at a hardware store. Five days later, the baby was breathing on her own.

Last year, cardiologist Davila-Roman joined the mission, bringing a team of heart care specialists to the hospital, which has no cardiologist. The staff of the hospital's emergency room frequently called on the volunteers for help with critically ill patients with heart complications.

Their missions, though brief, have durable effects.

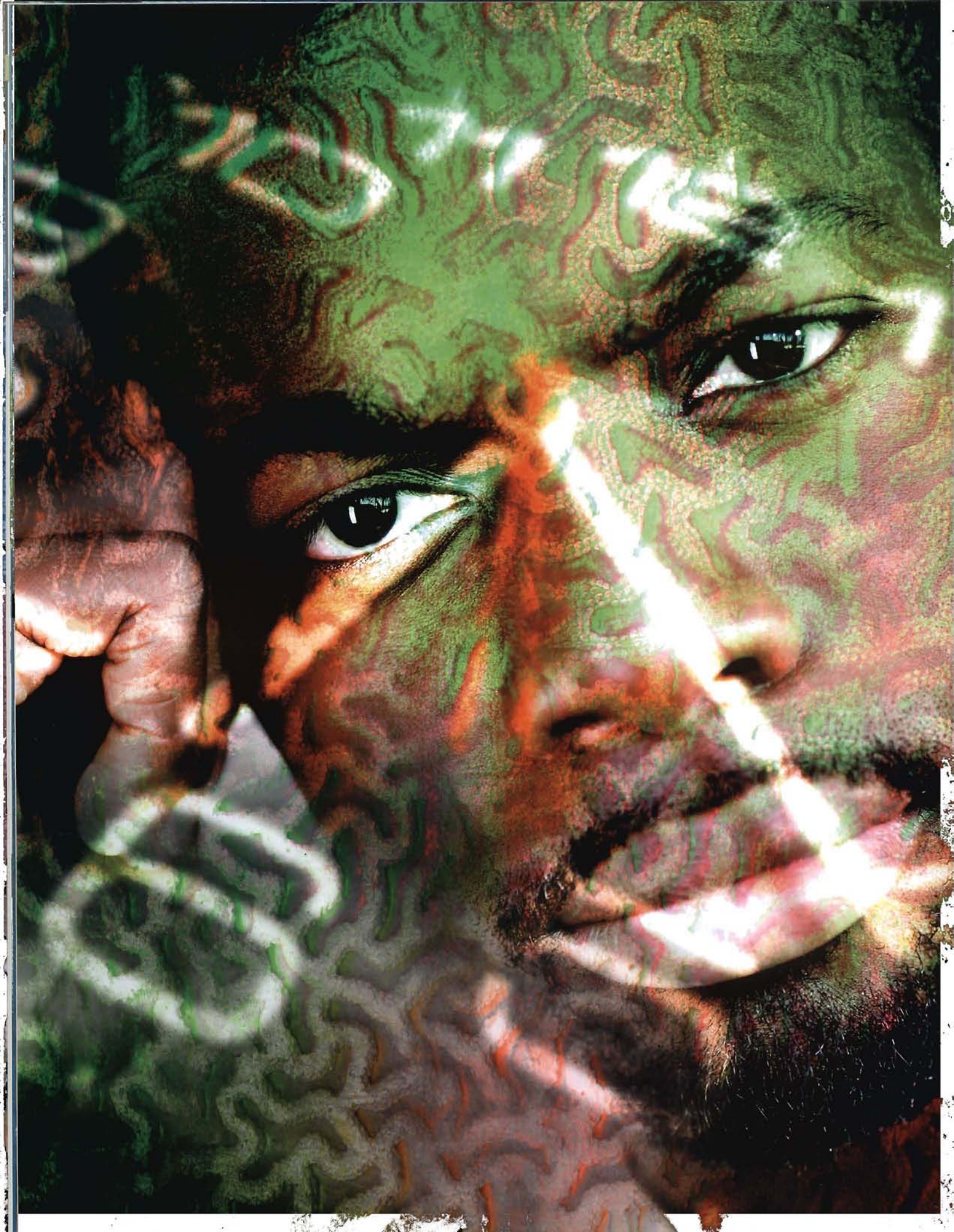
Each year, they offer training to update the skills of local physicians, and increasingly they are finding that returning patients have better control over their medical conditions. The groups also bring in medical students from the

local medical school at the Universidad Católica so they can gain valuable experience. In collaboration with this medical school and Esteban González Burchard, MD, and Joshua M. Galanter, MD at the University of California, San Francisco, Castro has helped set up a research program to study the genetic causes of asthma among Hondurans as part of a larger study of asthma genetics in Latino populations.

Recently, Castro, other members of the IMAF, and leaders of Catholic dioceses in Honduras and Fort Worth, began pushing for a new hospital in Olancho, the state in which Juticalpa lies. It was clear to them that the single hospital in Juticalpa was insufficient to serve the half million people of Olancho. Funding from the Honduran government, St. Louis contributors, and the Fort Worth diocese made possible the construction of Hospital Santo Hermano Pedro in the nearby town of Catacamas.

The hospital is set up especially to accommodate groups such as the pulmonary brigade. A permanent staff of doctors and nurses will provide primary care, and medical teams from outside Honduras will provide specialized care. The hospital contains a residential area for the traveling teams to stay in.

"The people we see during the medical missions are so appreciative," Castro says. "That's one of the things that keeps us going back every year and why we've worked to make permanent improvements. It's very hard work, but everyone who goes finds it extremely rewarding." □



Whether it's consciously engaged or not, the brain never rests.

THE 24/7 BRAIN

Better understanding can aid treatments for injury and disease.

BY MICHAEL PURDY

FOR DECADES, neuroscientists were like mental drill sergeants, always directing volunteers to do something: *read this word, listen for that sound, add these numbers, tap your finger*, and so forth.

As volunteers worked, scanners tracked changes in their brain's blood flow and oxygen use, which increase when neurons in a brain region become more active. Researchers could compare and contrast the results of slightly different tasks (reading a word aloud versus reading a word silently, for example) to determine which brain regions were essential to particular mental abilities (in this example, speech).

Scientists built a tremendous wealth of knowledge using such approaches, but Marcus E. Raichle, MD, professor of radiology, neurology and neurobiology, and his colleagues had lingering questions.

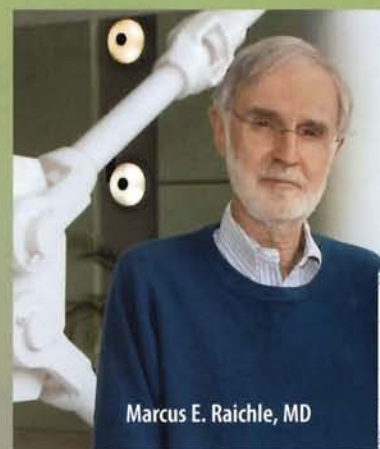
Raichle noticed, for example, that the brain's total energy usage only went up a measly 5 percent or so when volunteers performed these tasks. Based on blood flow and oxygen use, he estimated that scientists could not link 60 percent to 80 percent of the brain's overall energy usage to any kind of conscious mental activity or external events. What was all that energy being used for?

Raichle and his colleagues started calling the mysterious resource consumption the brain's "dark energy," naming it after an astronomers' term for the force that compels the universe to expand faster as they look farther out and further back in time. Like the astronomers, neuroscientists knew something was there by the effect it was having, but they didn't know what that something was.

In the mid-1990s, Raichle's group found by accident that energy usage in certain regions of the brain consistently decreased when volunteers began cognitive tasks. This led them to conduct a series of brain scans with a key difference: they asked the volunteers to just relax.

It soon became clear that certain brain regions were more likely to be abuzz with activity when volunteers did nothing and that this activity dropped as participants took up mental tasks. Hints of this background brain activity had earlier been dismissed as "noise," but over time, Raichle and others established it was part of a previously unrecognized brain system known as the default mode network (DMN). They have amassed evidence that the DMN helps the brain organize memories and prepare for future events, and that impairments in the DMN may be connected to a wide range of neurological disorders, including Alzheimer's, depression and schizophrenia.

This approach to analysis of brain organization is now called functional connectivity (FC), and it's opening up new horizons in neuroscience in laboratories at the School of Medicine and around the world. — *Continued on page 20*



Marcus E. Raichle, MD

UNCEASING

A device in your home uses energy nonstop. In fact, it consumes energy in vast quantities relative to its apparent output. Experts cannot fully account for this remarkable, seemingly wasteful discrepancy, and speculate that its perpetual engagement with tasks unknown may be vital for its overall utility. ►



Alex Carter, MD, PhD, and Maurizio Corbetta, MD, assess brain imaging data.

Balancing the brain

The left side of the brain controls the right side of the body, and vice versa. But brain function may not be so simple in practice. Networks within and between the two sides of the brain appear to balance each other. Damage such as stroke can disrupt this balance, making it hard, for example, for a patient to render both sides of a clock face. Scientists are working to find ways to help the brain rebalance itself.



ACTIVITY

But don't pull the plug — that energy drain is your brain. For years, scientists studied what parts of the brain "fired" during tasks. Such interactions with the external world, however, used minimal mental resources. It turns out that most brain activity — and energy — is directed toward its unseen, inner workings. And these probably make all the difference for what it means to be human.

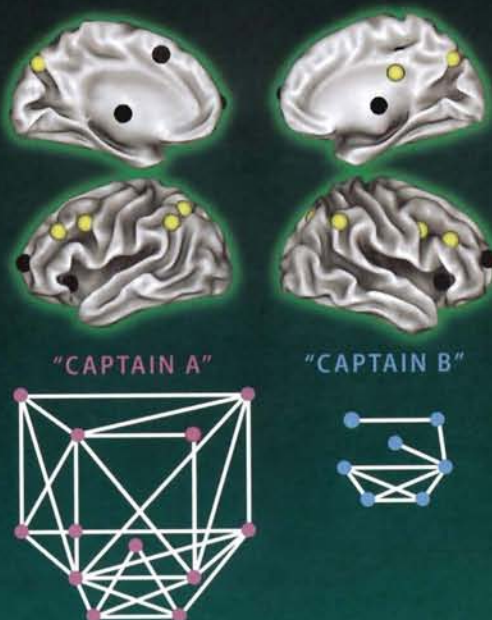


Steven E. Petersen, PhD, right, and Nico U. Dosenbach, MD, PhD, in the laboratory.

One ship; two captains

Surely a master controlling network — functioning like the captain of a ship — was active in the brain, and researchers set out to find it. They were surprised to detect not one but two networks serving in tandem to guide goal-oriented behaviors. In adults, one network (A) helps to initiate behaviors, the other (B) to sustain them, and the networks are physically quite distant from one another. Further research has shown that the networks within children's brains differ significantly from adults.

Where the networks are located





Popular culture sometimes depicts the brain

as a control room or ship's bridge from which a central authority figure issues all the directions. Steven E. Petersen, PhD, the James S. McDonnell Professor of Cognitive Neuroscience and professor of neurology and psychology, and his colleagues have used FC to look for this "little person up top telling everyone else what to do" in the brain.

To their surprise, they found the human mind has not one but two captains. They are separate networks of brain regions that do not consult each other but still work toward a common purpose: control of voluntary, goal-oriented behavior.

Using conventional brain-scanning techniques, Petersen's group had earlier identified a set of brain regions that became active just before a volunteer began a variety of tasks. They then used FC to look at when blood flow and oxygen use rose and fell in those regions as volunteers rested. Next, they analyzed the results, employing a mathematical technique called graph theory to draw links between brain regions where those surges and drops often happened in sync.

"You might expect that everything is connected to everything, and you would get sort of a big mess from that analysis and not much information, but that's not at all what we found," says Nico U. Dosenbach, MD/PhD, who was a student working in Petersen's lab during the research.

Instead, two clear master control networks emerged. Typically, the networks consisted of brain regions physically distant from each other.

In a more recent set of experiments, scientists used FC scanning on 210 volunteers ages 7 to 31 to see whether the control networks they had identified changed as the brain matured. (They set the lower age limit at 7 because at that point the brain has mostly finished growing in size.) They found significant differences in the organization of the child's brain compared to that of adults, but not the utter mess that the parent of an unruly 7-year-old might expect.

"Regardless of how tempting it might be to assume otherwise, a normal child's brain is not inherently disorganized or chaotic," Petersen said. "It's differently organized, with much more emphasis on connections between regions that are physically close to each other than in the adult brain. But a child's brain is still at least as capable as an adult brain." Petersen and his colleagues hope to use what they learn about the brain's control networks and how they normally develop to better understand and possibly one day seek treatments for developmental disorders and brain injuries.

Part of the challenge of understanding and treating

brain injuries has been that physicians can quantify where and to what extent the brain has been damaged, but they can't always use those measurements to predict how an injury will affect the patient. This has led Maurizio Corbetta, MD,

the Norman J. Stupp Professor of Neurology, and others who treat such injuries to look at how brain damage can affect activity in brain regions that are functionally connected to but physically

distant from the injury.

"To promote optimal recovery, it's critical that we map the functional impact of lesions on distributed brain networks that reach beyond the injury site," Corbetta explains.

In an early proof of this concept, Corbetta and his colleagues looked at spatial neglect, which affects 3 to 5 million brain injury patients annually and causes most patients to have trouble paying attention to their left side.

"After the injury, these patients may forget to shave the left side of their face or seem to be unaware of their left arm," says Corbetta, the clinical director of the Stroke and Brain Injury Program at the Rehabilitation Institute of St. Louis.

The condition typically results from an injury to the right side of the brain. That a right-side injury disables left-side attention is not surprising; neurologists' established understanding of the brain puts the brain's right side in charge of the body's left side, and vice-versa.

But when scientists used conventional brain-scanning techniques to study spatial neglect patients as they performed visual tasks, they could see that not only had activity in the right side of the brain diminished, the left side of the brain had become significantly busier. Greater overactivation of the left side was linked to greater problems with spatial attention.

In more recent studies, the researchers tested whether FC could be used to predict how stroke damage affects patients. In 23 patients who had recently suffered a stroke on one side of the brain,

researchers assessed the strength of the connections in two networks, one for moving the arm and one for paying attention to the environment. Each includes regions in both hemispheres of the brain. Patients with damage to connections linking regions in both hemispheres were more likely to suffer a greater degree of impairment after the stroke.

That meant, for example, that stroke damage on the left side of the brain might lead to problems with control of the right arm, but the losses were worse if the left-side damage disrupted network connections with the right side of the brain.

This and other recent findings have neuroscientists thinking they may need to adjust their picture of how the brain's hemispheres divide control of the body.

"It's not wrong to say that one side of your brain controls the opposite side of your body, but we're starting to realize that it oversimplifies things," says Alex Carter, MD, PhD, assistant professor of neurology.

To further define and confirm FC's clinical applicability, researchers are planning additional studies of brain injury patients. They also plan to use FC in long-term studies of the recuperation of such patients. □

"It's not wrong to say that one side of your brain controls the opposite side of your body, but we're starting to realize that it oversimplifies things."

Alex Carter, MD, PhD



*Lectures are so old school.
Interactive methods are reshaping education.
Socrates would approve.*

The NEW Learning

BY HOLLY EDMISTON



Most students who ever attended the School of Medicine

were taught using traditional lectures. In recent years, educators began experimenting with new, interactive teaching methods. Since technology is second-nature to current students, using it to foster more classroom interaction has made a challenging learning experience more engaging, effective — and enjoyable.



At the click of a button: Using clickers to actively answer questions during lectures and labs keeps students engaged in course material — and gives the instructor real-time feedback about the students' comprehension of the material.

Interaction and application are the keys to truly learning the presented material, says David W. Windus, MD, associate dean for medical education and professor of medicine. In the traditional lecture-based format, he says, only a handful of students typically raises their hands to comment or ask a question; others passively take notes.

That was frustrating to Windus for two reasons: It was hard to know what students were getting out of the lecture, and it also seemed to encourage last-minute cramming to learn the material just before a test. So he turned to team-based learning, a concept he says was borrowed from the business school environment.

"In medicine it's also absolutely critical to learn how to work in teams," says Windus. "If you can't do that successfully, you're not going to do as good a job with patient care."

How does team-based learning work? In a typical scenario, students are given a preparation assignment to complete outside of class. In the first hour of the next two-hour class, students

must demonstrate they learned the material by taking a short, multiple-choice quiz. Then, the larger class is broken into smaller teams to work together on the same questions. As the instructor electronically monitors both individual and team responses, he or she is able to build a discussion using those responses as a springboard.

The results bear out the method. According to Windus, individual results typically average 80 percent correct, while the average team rate is 100 percent. "In other words," he says, "they teach each other the correct answer."

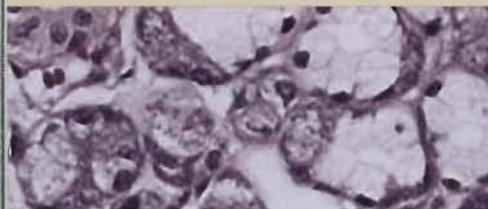
Next, after completing the first hour's material, the teams now tackle a more difficult set of questions that require critical thinking. They might be asked to design questions for the clinical study of a disease or to study a published article and interpret a figure or data. While the first hour of the course is closed-book, in the second hour students can use any means at their disposal to research, answer and ultimately defend their team response.

Other instructors have begun to use the team-based learning approach in their courses as well. Amanda R. Emke, MD, instructor in pediatrics, has been using the audience response system since she became course master for the second-year preclinical pediatrics course three years ago. She incorporates the method into a couple of lectures each term, and this year she used it as part of team-based learning sessions.

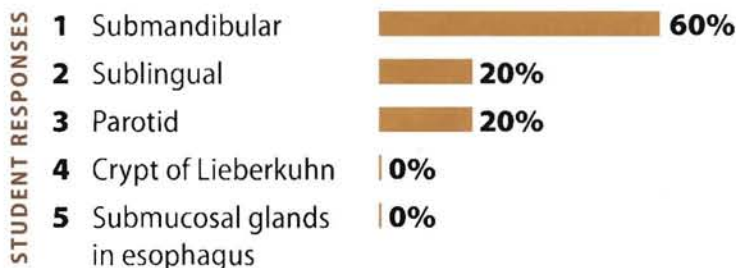
"The audience response system makes students more engaged with the material to be learned and this transforms the learning process from passive to active," says Emke. "It improves retention."

But the interactive method isn't just for use in the lecture format. Paul C. Bridgman, PhD, professor of neurobiology and course master for the Histology section of Cell and Organ Systems Biology, uses team-based learning with clickers not only in his lectures, but also in the laboratory.

An example of a multiple-choice question used during an audience response team-based learning exercise. The corresponding answers can be instantly tabulated and shared with the group as a means to reinforce their learning.



What gland is shown on this micrograph?



DAVID W. WINDUS, MD

"We've been using the clickers for about five years for each topic that we cover in a lecture and corresponding laboratory," says Bridgman. "Students like to know how they are doing relative to their peers. The instant display of a graph showing how the respondent answered, along with the correct answer, gives them valuable feedback. And, since the responses to questions are anonymous, students are not reluctant to give answers."

According to first-year student Dorothy van Oppen, using the clickers keeps students engaged. "I like them because it is a good indication of whether or not I am understanding the lecture. In the lab, we use them as group discussion tools."

Other nontraditional methods are also gaining ground. Dyads — short breaks mid-lecture during which groups of two students confer about questions — are being used by Bridgman and others after being introduced at a curriculum meeting by second-year student David M. Levine, a former Chicago Public Schools high school teacher. Levine, the medical education representative for his class, notes that dyads require students to be active learners. In addition, the short "breaks" during a lecture can have the effect of regaining students' attention if it has started to wane.

Allyson R. Zazulia, MD, associate professor of neurology and radiology, has incorporated two nontraditional methods into her teaching (see sidebar).

"I am always looking for different techniques to enhance learning," says Zazulia, who also assigns students to work on a patient diagnosis and management plan outside of class. "Though students sometimes complain about how much time they spend on it, they appreciate the opportunity to work together on the assignment. It also lets them feel like real doctors."

While the School of Medicine is embracing new methodologies when they are a good fit, it is not making them mandatory for all courses. A committee of course masters meets regularly and every course comes under review at least once every two years. Student representatives also serve on the committee, and it is this collective input that often convinces instructors to try something new.

"Students are principally here to learn and faculty principally to teach, but we do learn from each other," says Windus. "We've created an environment in which students are very involved with how courses are evaluated. It's a two-way street." □



Course master Allyson R. Zazulia, MD, left, leads students in a Jeopardy!-themed year-end review of her second-year course Diseases of the Nervous System.

Fine-tuning learning and teaching by solving puzzles, playing games

In Allyson R. Zazulia, MD's classroom, learning is not only interactive — it's fun! For the past six years, she has used the game show Jeopardy! as the basis for an end-of-course review.

"Because it's fun, students are more likely to participate," says Zazulia. "The game show format allows for a controlled review in the answer/question format, rather than a less interesting listing of important topics or an unstructured, 'Does anybody have any questions?' hour."

Students seem to agree.

"Reviewing course material in this interactive, comprehensive and entertaining way is much more engaging than a traditional lecture-style review session," says second-year student Hassan Akbari. "The review also lets students realize their individual strengths and weaknesses on the various topics while providing them

with an opportunity to learn from each other."

Another innovative approach, however, proved less successful. Zazulia introduced the "jigsaw" method, a variant of team-based learning, into a lecture this past year. The technique has students form teams to study multiple separate but related topics, with each individual becoming an expert on their topic and in turn teaching it to others in the group.

"What I liked about the idea was that it gave students an opportunity to learn about a topic and think about the best way to present the material in a lecture with a limited amount of time," says Zazulia. "It also required that they depend on their teammates for information they didn't know, encouraging them to work together."

Feedback, however, showed that students felt they learned their own topics well, but never took ownership of their teammates' material. Zazulia is rethinking the exercise and may present an altered version of it next year.

"Interactive, comprehensive and entertaining...much more engaging than a traditional lecture-style review session."

Second-year student Hassan Akbari

A dedicated group of
emergency medicine residents
travel to Haiti to alleviate
suffering among survivors of
the earthquake.

MEDICINE

in a mango grove

DURING A HECTIC SIX DAYS IN HAITI a few weeks after the January 12 earthquake, Washington University emergency medicine physician Liza Halcomb, MD, treated hundreds of patients, one sicker than the next. Some had malaria or typhoid; others had open wounds or bad fractures. Nine women gave birth at this tent hospital in Petit-Goâve, 42 miles west of the capital of Port-au-Prince, sometimes to sick or premature babies. Yet even amid this crowd of suffering people, a few faces stood out.

One night around 2 a.m., Halcomb had just dropped off to sleep when a motorcycle raced into camp. Frantically, its driver told of a dying woman — could they come? Halcomb and her father, retired St. Louis neurosurgeon Robert Dunn, MD, followed him into the night and eventually came to an eerie place: an abandoned hospital, ruined by the quake, with desperate patients camped on the grounds and no medical personnel anywhere.



Liza Halcomb, MD

The woman they were seeking was among them. A building had collapsed on her during the quake and severed her spinal cord, then she had received some medical care. For a month now, her family had been tending to her patiently, trying to relieve her pain, but her catheter was blocked and she had developed an infection. So the team fixed these problems — and took on the toughest job of all.

"No one had told her that she would never walk again," says Halcomb, assistant professor of emergency medicine and section chief for toxicology, who had to break the horrible news. "We set her up with a Canadian physiotherapy group that would get her a wheelchair. It was awful, but Haitians are the toughest people I have ever seen, just incredible."

Halcomb and her father were not the only St. Louisans at the site. Coordinating the care at this makeshift facility, located in a Wesleyan Church compound, was a not-for-profit organization, Aid for Haiti. In 2008, Barnes-Jewish Hospital (BJH) resident Caleb J. Trent, MD, and some friends, then University of Tennessee medical students, had founded this faith-based group, which focused initially on treating goiter in rural Haitians.

Within two weeks of the quake, the Aid for Haiti board had met and decided to act. With the blessing of residency director Douglas Char, MD, associate professor of emergency medicine, Trent and chief resident Chet D. Schrader, MD, took unpaid leave and went to Haiti, initially working in Port-au-Prince and then at Carrefour, the quake's epicenter. Hearing of a need in Petit-Goâve, they traveled there and found a tent

hospital set up in a mango grove adjacent to the U.S. Marines and began further organizing care. Soon lines of patients were waiting each morning to see them.

"The response was great, but the reason for it was tragic," says Trent. "It was terrible to see the need but fantastic to make a difference. The whole experience was life-altering."

He and Schrader made an urgent call to Barnes-Jewish for more emergency medicine residents to staff the hospital — and his colleagues came through. Residents Jonathan W. Heidt, MD, and his wife, Elizabeth, a nurse; Amanda A. Cannarozzi, MD; Joy L. English, MD; Jacob B. Keeperman, MD; Sue-Lin M. Hilbert, MD; Kari Schneider, MD; and Amy J. Kroeger, MD, all agreed to take stints at the camp. To fill a brief gap in coverage, Halcomb and her father stepped in.

In March, the Petit-Goâve camp began winding down operations, but the Washington University/Barnes-Jewish



Caleb J. Trent, MD, left, assisted by physical therapist Ashley Schrader and Aid for Haiti volunteer Michael Rudolph, splint a woman's leg.

group had covered its medical care through February. The Aid for Haiti group is making plans to return to the beleaguered country. "Before, we were in this up to the ankles, and now my wife says I'm well above the knees," says Trent. "But I think I'm at least waist deep. My involvement will be

for the long haul." And Halcomb, who has worked in various parts of the world, is trying to arrange a long-term partnership between the School of Medicine and a hospital on La Gonâve, an island off the Haitian coast. She is also hoping to establish an international emergency fellowship at Washington University.

"You can run a clinic and help some people, but you realize how vast a need there is," she says. "We need to make our efforts sustainable. This was a practice run, and I am so impressed with our residents. They are just wonderful people." □

"It was awful, but Haitians are the toughest people I have ever seen, just incredible."

LIZA HALCOMB, MD



PHOTOS COURTESY OF CALEB J. TRENT, MD, AND LIZA HALCOMB, MD



Rock and rollers' reunion

Class of '59 ensures that future generations can make a difference too

Charles C. Norland, MD '59, knows he was fortunate that his parents were able to pay for his medical school tuition. "Everyone realizes the difficulties students are having these days because tuitions are so high," he says. "It's a different ballgame."

Approximately three quarters of today's School of Medicine students graduate with debt, and more than half of these students begin their careers with debt exceeding \$100,000.



Charles C. Norland, MD,
and his wife, Dorothy

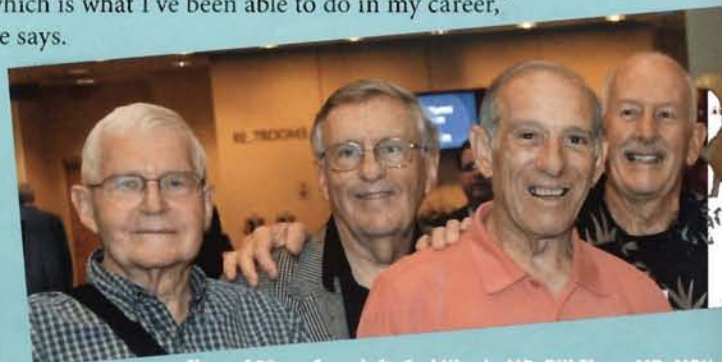
While serving on the faculty of the University of Miami Miller School of Medicine for 20 years, Ann Randolph Flipse, MD '59, saw firsthand the burden of debt that so many students face. "And it has changed the practice of medicine in this country," she says.

These observations motivated Norland, Flipse and others in the medical school's Class of 1959 to permanently endow a scholarship for medical students in honor of their class' 50th Reunion in May 2009. The Class of 1959 Reunion Committee initiated funding the scholarship. Seventy percent of the class made gifts and commitments to support the scholarship, providing remarkable support for this effort.

"The enthusiasm was amazing," says Norland. "Once someone came up with the idea, it all came together."

Twenty-five medical school classes have made gifts to establish endowed scholarships, a tradition that was started by the Class of 1969 in honor of its 25th Reunion.

David L. Winter, MD '59, says he was motivated to donate to the scholarship because of a strong sense of obligation to the school. Prior to medical school, he had studied liberal arts and minimal science. But medical school professors such as Robert B. King, MD, and Henry G. Schwartz, MD, opened Winter's eyes to the world of science. "They also taught me how you could combine science and medicine, which is what I've been able to do in my career," he says.



Class of 59ers, from left, Carl Hirsch, MD, Bill Elsea, MD, MPH,
Milton J. Deitch, MD, and Sanford L. Severin, MD

After graduating, Winter trained under famous surgeon Michael E. DeBakey, MD, at Baylor University School of Medicine; developed cyclosporin, the immunosuppressive drug for transplantation; and served as director of life sciences at the National Aeronautics and Space Administration. He now is medical director for a contract research organization and serves on the boards of a medical device company and a company that is converting biomass into electricity.

"I just felt like supporting the scholarship was something I should do," Winter says. "It is a way of repaying a small amount of what I owe the school."

Norland had a successful career as a gastroenterologist in St. Louis that included teaching and clinical responsibilities at the School of Medicine. When he retired from medicine at age 65, he started a photography business, Norland Photographic Art.

He still finds it hard to believe that five of his teachers were Nobel Prize winners and has been impressed that the medical school has remained a top-notch institution throughout the years.

"Being associated with Washington University and teaching medical students and house staff was the highlight of my career," Norland says. "I just love Washington University; it's a wonderful place."

Flipse says that every time she met a School of Medicine graduate at an academic medicine meeting, she felt an enormous sense of pride in the school and her fellow alumni.

"All physicians share a bond," she says. "The bond is greater when a Washington University graduate finds another Washington University graduate."

After finishing medical school and subsequent training, Flipse practiced pediatrics for 13 years in Miami. She and her husband, an internist, had adjacent offices and sometimes cared for three generations of families.

Nobuko O. Kuhn, MD 59, counts being a Washington University graduate as her greatest accomplishment. She says she supports the scholarship because she wants to give deserving students the best opportunity of their lives, just like she had.

Kuhn's medical education prepared her for a career in which she practiced internal medicine with the Labor Health Institute and became a disability consultant to the Missouri Department of Education. She also served as a disability consultant to the Massachusetts Department of Rehabilitation.

Additionally, she met her husband, the late Charles Kuhn III, also a member of the Class of 1959, while in medical school.

"On a personal level, Washington University taught me to think and observe critically," Kuhn says. "Furthermore, an immigrant's daughter became a doctor and found the perfect mate. On a professional level, I believe that the institution's sterling reputation made it easy to obtain positions."

Opening doors to the future

A gift to your class endowed scholarship is a terrific way to support the School of Medicine and its wonderfully talented medical students. Even if you aren't celebrating your medical school reunion this year, your support of scholarships is important!

- For the 2009–10 school year, 14 medical students received School of Medicine Class Endowed Scholarships, exceeding \$120,000 in aid.
- There are now 25 Class Endowed Scholarships, with the Classes of 1960 and 1985 establishing their own this year.
- Together, you and your classmates can provide much needed scholarship support for students!

If your class does not have an endowed scholarship, or you would like more information about making a gift to the School of Medicine, please contact Ashley Snyder at (877) 816-2586, (314) 935-9686, or medicalannualfund@wustl.edu.



**Ann Randolph Flipse, MD,
and Nobuko O. Kuhn, MD**

Flipse, who retired in 2005, says she wanted her class to endow a scholarship in hopes of encouraging the recipients to understand that they have ties to people who have gone before them, some of whom have done extraordinary things.

"I think an endowed scholarship is a great footprint for the class to leave," Flipse says. "I want students who receive support from our class scholarship and those established by other classes to understand they come from a great tradition."

Scholars in Medicine

Scholarships help future medical professionals train to serve others

On Saturday, November 21, 2009, Washington University School of Medicine hosted its second annual Scholars in Medicine Donor Recognition Dinner. The event offers a unique opportunity to acknowledge alumni and friends who have supported scholarships and to introduce donors to the exceptional students who benefit from their contributions.



SCHOLAR Jessica L. Humbach
SPONSOR Shirley A. Sahrman, PT 58

More than 140 medical, physical therapy and occupational therapy students were joined by alumni, friends and faculty members who have generously supported annual and endowed scholarships.

Joseph Davie, MD 68, a scholarship donor and member of the Scholarship Initiative Committee, offered a personal perspective on the importance of scholarship support. Fourth-year medical student Carlie Kennedy represented the students and expressed gratitude to the donors who help to make Washington University School of Medicine affordable.



SCHOLAR Katie C. Kurnit
SPONSOR Joseph M. Davie, MD 68



SCHOLARS Cindy E. Zhang, left, and Anna S. Graseck
SPONSOR Elise F. Csapo



SCHOLAR Kavitha R. Sivaraman
SPONSORS Susie B. and Gordon W. Philpott, MD 61



SCHOLARS Jessica A. Quinlan, center, and Jourdan E. Stuart
SPONSOR Emily L. Smith, MD 68

PHOTOS BY MARK ELAYEN

Alvin J. Siteman commits new funds for innovative cancer research to improve prevention, treatment

The Alvin J. Siteman Cancer Center and Washington University have received from Alvin J. Siteman a commitment for an endowment that will provide at least \$1 million annually to advance pioneering investigations into cancer prevention, diagnosis and treatment.

The new endowment establishes the Alvin J. Siteman Cancer Research Fund, which will provide support for transformational scientific contributions that address the challenges associated with overcoming cancer.

"I have been privileged over many years to be associated with Washington University, the School of Medicine and Barnes-Jewish Hospital," Siteman says. "With the continuing growth and development of the Siteman Cancer Center, the progress made in treating cancer patients through expanded research programs has been encouraging. I am delighted to be able to contribute further to that effort by supporting projects on the leading edge of cancer research, which promise even greater hope for the future."



A visionary leader: Alvin J. Siteman provides impetus for medical, scientific breakthroughs

In 1999, Alvin J. and Ruth Siteman committed \$35 million to the development of the Siteman Cancer Center at Washington University School of Medicine and Barnes-Jewish Hospital. This commitment comprised the largest gift ever received by Barnes-Jewish and Washington University in support of cancer research, patient care and services, education and community outreach.

The newly established Siteman Cancer Research Fund is intended for both short-term projects and significant major initiatives. It will be targeted particularly for innovative programs that might not receive funding from federal agencies. The fund will be a resource to catalyze fruitful research progress that will attract additional foundation, corporate or federal research support.

"The Siteman Cancer Research Fund will enhance the impact of the Alvin J. Siteman Cancer Center and cancer research throughout Washington

University," says Washington University Chancellor Mark S. Wrighton, PhD. "The Siteman Cancer Center's wide-ranging research programs offer great hope for progress against cancer, and the new Siteman fund will give impetus to projects that epitomize scientific ingenuity,



Alvin J. Siteman

allowing our most inventive scientific minds to pursue new concepts in the fight against cancer." Funds will be available to the leaders in many

fields of science, medicine and engineering at Washington University and will support the acquisition of equipment and facilities needed to open new veins of investigation. "We are truly grateful to Mr. Siteman for his generous gift, which, by focusing on breakthrough research, will no doubt encourage major advances in the

prevention, diagnosis and treatment of cancer," says Larry J. Shapiro, MD, executive vice chancellor for medical affairs and dean of the School of Medicine.

Siteman Cancer Center Director Timothy J. Eberlein, MD, Wrighton and Shapiro will be responsible for identifying especially significant initiatives related to overcoming cancer in humans and for encouraging research proposals from Washington University faculty and research staff requesting support. Review of proposals will come from acknowledged experts in the relevant field who may be drawn from the Siteman Cancer Center External Advisory Committee.

"This is a phenomenal expression of support that Mr. Siteman has given our cancer center members," Eberlein says. "This continuing gift will assure that the Siteman Cancer Center continues to maintain our national leadership in developing innovative cancer treatments for our patients."

The Duesenberg Family

Altruism in action

In 2006, 68-year-old Lorraine (Lori) Duesenberg was having lunch with friends at a Washington, D.C., restaurant when she suddenly looked down at the floor as if she had dropped something and stopped participating in the conversation. When asked if she was OK, she didn't respond for a few minutes. Then she became ill.

Restaurant staff called paramedics. Lori was sent home, but the incident was a harbinger of a medical battle to come. She still felt ill after arriving home, so she and her husband, Robert, went to a nearby emergency room. There, physicians determined she had a growth in her brain.

Surgery at Fairfax County Hospital in Virginia the next day revealed a glioblastoma multiforme, a common, aggressive type of brain tumor that is difficult to treat. The tumor was removed, caught at an early stage.

Following a year of chemotherapy and radiation in Washington, where Robert was general counsel and executive vice president for General Dynamics, Lori and Robert decided to return to St. Louis. She became a patient of neuro-oncologist Gerald P. Linette, MD, PhD, assistant professor of medicine, and Ralph G. Dacey Jr., MD, the Henry G. and Edith R. Schwartz Professor and chair of the Department of Neurological Surgery.

The Duesenberg's son, John, vividly recalls the day in 2006 when he found out his mother needed brain

surgery. He was driving home from work as an in-house counsel for a payment processing company in Denver when his dad phoned him.

John says not knowing how long he has with his mother has become a way of life. "I spend time worrying and hoping and just sitting with this reality," he says. "I also just enjoy the moments with her and Dad."

Since her diagnosis, Lori, a retired nurse, says she has a different perspective on life. "I get involved in less and spend more time with family and friends," she says. "I'm also always making sure we're in touch with the Lord and grateful for each day."

His mother's care inspired John to establish a fund at the School of Medicine for brain cancer research. "Washington University is an important institution," he says. "It seems very natural to give to the university."

The Duesenberg family, including Robert and Lori, John, and John's sister, Lynda Koeppen, and her husband, Karl, have contributed to the Robert

and Lori Duesenberg Fund for Brain Cancer/Tumor Research since 2007.

"Each year in the United States, there are more than 17,000 new cases of malignant brain tumors," says Dacey. "The generous gift of the Duesenberg family will make it possible for us to initiate new research into the mechanisms that underlie the development of these tumors. Our department is committed to developing new research protocols and clinical trials in order to continue this important research."

Lori says she and her husband are happy to support the research fund. "It is our hope to promote research for earlier diagnosis and treatment of brain tumors," she says. "Washington University physicians are on the cutting edge of this research, and we want to help them accomplish their mission."

"I want this fund to be something that represents the type of people my parents are — very altruistic," says John. "If there can be advances in any kind of treatment, I'll feel like the money has been put to good use."



Above: Robert and Lori Duesenberg with children, from left, Lynda Koeppen, John Duesenberg and Kirsten Duesenberg Hazlett. **At right:** John and Lori Duesenberg with Ralph G. Dacey Jr., MD.

Amit Patel

A most enterprising scholar

AMIT PATEL is a fourth-year medical student who hails from Dalton, Ga. He attended Duke University for his undergraduate education, where he received a bachelor of arts degree in history and biology, graduating summa cum laude. He recently matched for residency training in internal medicine at Barnes-Jewish Hospital. Patel hopes ultimately to have a career in which he can interact and build relationships with patients, as well as teach and mentor physicians in all phases of training.

In addition to fulfilling his academic requirements, Patel took advantage of the summer break between his first and second years of medical school to work in the Division of Emergency Medicine in the Department of Pediatrics at Washington University School of Medicine. His work was supported by a National Institutes of Health clinical research training grant and focused on comparing sedation regimens for children undergoing abscess drainage in the emergency room.

Currently, under the mentorship of C. Prakash Gyawali, MD, associate professor of medicine in the Division of Gastroenterology, Patel is investigating the treatment of functional dyspepsia with neuromodulators in patients with delayed and normal gastric emptying.

"Amit came to me to discuss his career interest in gastroenterology early in his third year of medical school," says Gyawali. "He is enthusiastic, dedicated and committed, and an abstract of his preliminary findings from the project has been accepted for presentation at

the annual meeting of the American Gastroenterological Association. I look forward to future projects with him."

Throughout medical school, Patel has been involved in service-oriented and leadership activities. He volunteered with the Students Teaching AIDS to Students (STATS) program, for which he also served as a coordinator during his second year.

Additionally, he is the president of the Class of 2010. In this capacity, he has organized preclinical student groups, chaired the Medical Student Government, and coordinated school-wide programs such as peer advising, diversity week and teaching awards.

Patel also is serving as a mentor for the Practice of Medicine course for first-year medical students, in which he helps them investigate and appraise clinical literature, connect their basic science courses to clinical dilemmas, and reflect on their clinical experiences. When not involved

in his many academic and extracurricular activities, Patel enjoys playing basketball and tennis, reading military history and watching movies.

Patel's experience at Washington University School of Medicine would not have been possible without significant scholarship support. He is appreciative of the financial assistance he has received, and Patel knows that scholarships have helped attract the best and brightest fellow students, too.

"As class president, I have seen firsthand the impact scholarships can have," says Patel.

"Washington University School of Medicine students are unparalleled, and without the generosity of our scholarship donors, we would not have the wonderful student body that we do. We are truly humbled and grateful for the opportunity to pursue our medical education at this amazing institution."



Fourth-year medical student Amit Patel, left, studies the finer points of gastrointestinal motility with his research mentor, C. Prakash Gyawali, MD. At an upcoming conference, Patel will present preliminary findings of a research project on which they collaborated.

1940s

James S. McLean, MD 48

McLean resides in Munster IN and is retired from general surgery. During World War II he was a medic for the U.S. Army; during the Korean War, he was a physician in the U.S. Air Force. Now retired, he spends his time playing cards, attending baseball games and gardening with his wife, Irene.

1950s

Frederick Hillman, MD 50

Hillman is retired and resides in Anchorage AK. He lives near his three sons and their families. He enjoys reading and is a member of a monthly book club.

Marvin E. Levin, MD 51

Levin and his co-editor, Michael Pfeifer, MD, announce the publication of the third edition of their book, *The Uncomplicated Guide to Diabetes Complications*, written for the lay public and published by the American Diabetes Association. The goal of this book is to help people with diabetes understand the disease and its potential complications so that they can actively participate in care.

John Commerford, MD 53

Commerford has retired from family practice and resides in St. Charles MO with his wife, Marion.

Donald H. Tilson, MD 55

Tilson works full-time as a staff orthopedist for Kaiser Permanente Health Plan. He enjoys reading, exercise and spending time with his family. He resides in Vancouver WA with his wife, Kirtley Gunn Tilson.

Albert C. Diddams, MD 56

Diddams is retired and in good health. He resides in Dewey AZ, spending his spare time walking nine to 18 holes of golf several times a week, playing with his G gauge train, and enjoying his friends and church life.

1960s

Gustav Schonfeld, MD 60

Schonfeld was named the first Samuel E. Schechter Professor of Medicine at Washington University School of Medicine in 2002. He recently closed his lab and has published a memoir, *Absence of Closure*, which details his survival of the Nazi concentration camps and his struggle to begin a new life in the United States. He shares his experiences with a variety of audiences and is a volunteer at the

St. Louis Holocaust Museum. Schonfeld lives in St. Louis MO with his wife, Miriam.

Jerome Skaggs, MD 60

Skaggs resides in Chester VA with his wife, Betty Skaggs. A family physician in private practice, he spends his spare time reading, golfing, skiing and gardening.

Joe Insoft, MD 63

Insoft retired from the practice of urology six years ago. He enjoys his vacation home and hiking in North Carolina. He resides in Gulfport FL with his wife, Shirley.

Sylvester Sterioff, MD 63

Sterioff is emeritus professor of surgery at the Mayo Clinic in Rochester MN. He spends his free time golfing, traveling and visiting his grandchildren. He and his wife, Yvonne, live in Rochester.

John C. Barber, MD 65

Barber has retired from ophthalmology. He recently published a book of short stories, *The Joy of Medical Practice: Forty Years of Interesting Patients*. In his spare time, he enjoys gardening, travel and the theater. He resides in Pittsburgh PA with his wife, Dolores Smith Barber.

David L. Dunner, MD 65

Dunner directs the Center for Anxiety and Depression in Mercer Island WA and is professor emeritus, Department of Psychiatry and Behavioral Science, at the University of Washington. He is a member



McDonnell Professor in Medicine installed

Dennis E. Hallahan, MD, far right, the inaugural Elizabeth H. and James S. McDonnell III Distinguished Professor in Medicine, with donors James S. and Elizabeth H. McDonnell III, at left, and his wife, Helene. Hallahan is head of the Department of Radiation Oncology and serves on the Senior Leadership Committee of the Alvin J. Siteman Cancer Center. The School of Medicine is grateful to the McDonnells for their continued commitment to the university.

of the American College of Psychiatrists. He lives in Mercer Island with his wife, Peggy Zolbert Dunner.

1970s

Robert Harmon, MD 70

Harmon resides in Jacksonville FL, where he is director of the Duval County Health Department and clinical professor of medicine at the University of Florida College of Medicine. He enjoys tennis, golf, biking and travel.

Michael J. MacDonald, MD 70

MacDonald is professor of pediatrics, head of the pediatric diabetes endocrinology division, and director of the Children's Diabetes Center at the University of Wisconsin School of Medicine and Public Health. He enjoys taking care of children with diabetes, conducting research on the pancreatic beta cell, and teaching medical students. He resides in Madison WI with his wife, Kathy MacDonald.

Marilyn Mollman Rymer, MD 70

Rymer is professor of medicine at the University of Missouri-Kansas City School of Medicine. She is also the Edward T. Matheny Jr. Missouri Endowed Chair in Neuroscience and the medical director of St. Luke's Brain and Stroke Institute in Kansas City MO. She enjoys skiing, hiking, reading and traveling with her husband, Robert.

Steven Orkand, MD 74

Orkand has retired from medical practice after 30 years with Kaiser Permanente in Sacramento CA, serving as assistant chief of medicine and chief of rheumatology, a "fascinating clinical discipline" in which he remains intrigued. He and his wife, Jane, live in a passive solar home in Sacramento and are very interested in energy conservation and travel. Orkand also enjoys doing volunteer work and taking classes.

Robert M. Black, MD 75

Black resides in Framingham MA with his wife, Lisa. He is chief of the renal division at St. Vincent Hospital and Fallon Clinic in Worcester MA and clinical professor of medicine at the University of Massachusetts Medical School.

Linda A. Hershey, MD 75, PhD

Hershey is chief of neurology at VA Western New York Health Care. She resides in Amherst NY with her husband, **Charley Hershey, MD 77**. In her spare time, she enjoys knitting, scrapbooking and Sudoku.

Mitchell P. Fink, MD 77

Fink, a professor of surgery at the David Geffen School of Medicine at UCLA, recently left Boston MA and the biotechnology industry to return to academic clinical medicine. Prior to that, he was chairman of the Department of Critical Care Medicine at the University of Pittsburgh. He reports that, for the first time in his adult life, he has enough free time for all of his major hobbies: tennis, jogging and music.

1980s

David D. Chaplin, MD 80, PhD

Chaplin is professor and chairman of microbiology at the University of Alabama at Birmingham. He enjoys spending time with family, woodworking, gardening and working on social justice issues. He lives in Indian Springs AL with his wife, Jane.

Thomas W. Loeb, MD 80

Loeb, a plastic surgeon in private practice, lives in New York NY with his wife of 30 years, Patricia. He spends his free time traveling and playing golf.

Grant Stevens, MD 80

Stevens is medical director of Marina Plastic Surgery Associates and associate clinical professor of plastic surgery at the University of Southern California. He lives in Beverly Hills CA with his wife, Sheri. In his spare time, he enjoys ranching, hunting and travel.

Susan Davidson Rollins, MD 84

Rollins was presented with a Certificate of Special Expertise from the College of American Pathologists for her significant academic contributions in designing, developing and facilitating a program on ultrasound-guided fine needle aspiration. She practices in Johnson TN, where she owns and directs Outpatient Cytopathology Center.

Robert B. Darnell, MD 85, PhD

Darnell is the Robert and Harriet Heilbrunn Professor in Cancer Biology at Rockefeller University and an Investigator at the Howard Hughes Medical Institute. When not working, he spends time with his family, plays the cello and jogs. He lives in New York NY with his wife, Jennifer Cordes Darnell.

1990s

John O. Krause, MD 90

Krause recently completed his Air Force commitment and began a private practice. He is physician/owner of the Orthopedic Center of St. Louis. He lives in St. Louis MO with his wife, Karen.

Hamid R. Latifi, MD 90

Latifi is staff radiologist and director of the Nuclear Radiology Fellowship Program at Baylor University Medical Center in Dallas TX. He spends his spare time playing flamenco guitar and practicing Tae Kwon Do. He is a supporter of Children International and DonorsChoose.org.

Lynne Champagne, MD 93

Champagne has a private practice in internal medicine. She works a reduced schedule in order to spend time with her young children. She lives in San Diego CA with her husband, Wilfred Kearsce.

Bradley L. Schlaggar, MD 94, PhD

Schlaggar is the A. Ernest and Jane G. Stein Associate Professor of Neurology, associate professor of radiology, neurobiology and pediatrics, and director of pediatric neurology residency training at Washington University and St. Louis Children's Hospital. He also is a board member for KWMU, St. Louis Public Radio.

David A. Hunstad, MD 95

Hunstad, assistant professor of pediatrics and of molecular microbiology at Washington University, recently started his own fully funded research laboratory. He is a member of the Pediatric Infectious Diseases Society and Project ARK (AIDS/HIV Resources and Knowledge). Hunstad, resides in Fenton MO with his wife, Jennifer, and enjoys running, golf and attending Cardinal games.

2000s

Diana Weedman Molavi, MD 00

Molavi is a staff pathologist at Sinai Hospital in Baltimore MD. She completed her residency and fellowship at Johns Hopkins. She lives with her husband, Rameen, and their two children in Lutherville MD.

Joel Schilling, MD 00

Schilling is a heart failure and transplant cardiologist at Washington University School of Medicine. He lives in Lebanon IL with his wife, Denise, and their three boys.

IN MEMORY

Boyd Edwards Hayward, MD 46

Hayward passed away peacefully in his home with his wife and family present on Sept. 2, 2009. He attended Utah State University for undergraduate studies, graduated pre-med from the University of Chicago and earned his medical degree at Washington University School of Medicine. In addition to enjoying his practice for more than 30 years with his patients in Phoenix, he was involved with medical international community services in Thailand, Africa and Latin America. He was the founder of the Phoenix Chapter of the Amigos de las Americas in 1970 and, as medical director of Amigos, he prepared students to volunteer in rural Central and South America. Once retired, he enjoyed the study of Mesopotamian archaeology in Iran, Iraq and Egypt.

Maryrose Sauerhage Bush, NU 48

Bush died on Feb. 7, 2009, at age 82, in Twin Falls ID. While attending nursing school she met her husband, **Louis G. Bush, HS 48**. They married and moved to Pocatello ID in 1949. In 1961, her husband accepted a position with the Peace Corps and then with the Department of State as a physician for the Foreign Service; the couple lived and traveled all over the world. During their years overseas, Bush was very active, working at a leper colony in the Philippines and with Operation

Baby Lift in Saigon. They returned to Pocatello in 1978 and moved to Twin Falls in 2004. She was widowed in 2006.

Rosalyn Fryhoff, NU 49

Fryhoff died on Oct. 27, 2009. While a registered nurse, she worked at Hickman Mills Clinic in Kansas City MO and also as a school nurse. She and her husband, Gene, also owned and operated Fryhoff Real Estate in Sunrise Beach MO for 18 years. She was a member of the Ozark Chapel United Methodist Church and the Osage Community Elks Lodge and the Lady Elks in Laurie MO, was past president of the American Business Women's Association, and served as vice president of the MLS Realtors Association in Sunrise Beach. In her spare time, she enjoyed being outdoors, flowers and painting.

Taney German, NU 50

German died peacefully on May 12, 2009, at age 81. After graduating, she worked as a registered nurse at Barnes Hospital while her husband attended Washington University School of Medicine. She enjoyed life and cherished her family and was an active volunteer in many church, civic and community organizations. She served on many boards and particularly enjoyed her work with the Springfield Medical Auxiliary and the Springfield Art Museum.

Vincent Morgan, MD 51

Morgan died on Nov. 4, 2009. He graduated from Pacific Union College in Angwin CA, earning his bachelor's degree in chemistry, biology and religion. After graduating from Washington University School of Medicine, he did an internal medicine residency at Santa Barbara Cottage Hospital and was chief resident of internal medicine at Loma Linda University School of Medicine, White Memorial Hospital and Los Angeles County Hospital in California from 1957-58. He had a love for teaching and was assistant clinical professor of medicine and director of the outpatient clinic for senior medical students at Loma Linda. In addition, he was a medical malpractice consultant and was certified in workers' compensation for many years. He served as a captain in the U.S. Army

Medical Corps during the Korean War. He was in private practice in both California and Arizona for years until moving in 1995 to Missouri where he became medical director of the Western Missouri Correctional Center in Cameron. He also worked for four years at Mediquick Clinic in Columbia MO. For the last five years, he cared for local nursing home patients in the Columbia area. He was a very well-respected, caring physician who touched the lives of many people during his years of practice.

John Walter Schulte, MD 52

Schulte died on Sept. 19, 2009. During World War II, he served with the U.S. Navy, first in the Caribbean and then in the Pacific. After the war, he began pre-medical studies at the University of Texas in El Paso. He continued his medical studies at Washington University School of Medicine, specializing in pediatrics. He later served as a doctor with the U.S. Army and was stationed in several places across the country before settling in Salem OR in 1960. There he became the pediatric director at the Oregon Fairview Home before establishing a private pediatric practice, which he maintained until his retirement in 1997.

Walton Byrd, MD 59

Byrd died at age 76 on Sept. 16, 2009. He dedicated his life to helping patients in countless respects and will be dearly missed by so many he assisted along the way. He gave family, friends and patients alike the same strength, spirit and compassion everyday; his legacy is one of true benefit to the lives of others.

Viacheslav Platonov, HS 86

Platonov died on Sept. 15, 2009. He dedicated his life to founding and serving as the executive director of Small World Adoption Foundation of Missouri, Inc. He was also a prominent physician within the St. Louis community.

FACULTY

Morris D. Marcus, MD 34

Marcus, who served as chief of dermatology at Jewish Hospital for 51 years, died on Aug. 23, 2009. He was 99 years old and the last surviving member of the Class of 1934. He was a clinical professor of medicine and trained many future dermatologists. In 1999, he received the Alumni/Faculty Award from the Washington University Medical Center Alumni Association in recognition of his distinguished record of teaching and service. Following his retirement in 1988, he remained an active member of the Washington University community. He established the Morris D. Marcus Lecture in Dermatology, the Margaret Marcus Dance Fund in memory of his wife, and the Annelise Mertz Dance Studio in the university's Edison Theatre complex.

Seymour Monat, HS 41

Monat, 94, died on Oct. 21, 2009. After graduating from Long Island College of Medicine in 1939, he completed an internship and residency in obstetrics and gynecology at Barnes Hospital and Jewish Hospital and then practiced medicine in the St. Louis area for more than 40 years. He was an associate professor of obstetrics and gynecology at Washington University School of Medicine, as well as a past chief of obstetrics at Homer G. Phillips Hospital in St. Louis. He had many interests, including gardening, art history and classical music. He was devoted to his patients and the practice of medicine and never stopped learning or teaching.

Terry A. Fuller, MD 74

Fuller died on Oct. 5, 2009. He was an assistant professor of psychiatry at Washington University School of Medicine and was on staff at Barnes-Jewish Hospital. He completed a residency in psychiatry in 1977 and received his board certification in psychiatry and neurology in 1979. After conducting research for many years, he began private practice in 1987. A compassionate physician who loved his work, he also was a gifted athlete and a connoisseur of art, music and cinema.



Distinguished Alumni Scholars honored

Four first-year medical students were honored during the 2009–10 academic year as Distinguished Alumni Scholars. Each scholarship is named to honor an alumnus or alumna who has served on the School of Medicine faculty. From left: Paul R. Manske, MD 64; Jared D. Wilkinson; Jennifer Wray Cole, MD 84; Ran Ran; Matthew R. Schill; William J. Ross, MD 72; David R. Pearson; Robert A. Swarm, MD 83.

Mildred Cohn, PhD

Cohn, a research associate in biological chemistry from 1949–60, died on Oct. 12, 2009, in Philadelphia PA. She was 96. She worked in the lab of Carl and Gerty Cori, who received the Nobel Prize in Physiology or Medicine in 1947. Cohn's research pioneered the use of stable isotopes to study metabolic processes as well as mechanisms of enzymatic reactions. She was designated a career investigator by the American Heart Association, which funded her studies of adenosine triphosphate (ATP). She was among the first to apply electron spin and nuclear magnetic resonance to investigate metabolism. During the course of her career, Cohn worked in the laboratories of and co-authored scientific papers with six Nobel Laureates and was granted honorary doctorates from at least nine schools.

Teresa J. Vietti, MD

Vietti, a pediatric oncologist who earned the nickname "the mother of pediatric cancer therapy," died on Jan. 25, 2010, at age 82. A professor emerita of pediatrics and of radiology, she was an internationally renowned pioneer of pediatric cancer research and treatment. She conceived the concept of multi-institution pediatric cooperative groups and founded the Pediatric Oncology Group (POG), now known as the Children's Oncology Group (COG), which she chaired for its first 15 years. The success and growth of POG and COG are the impetus behind the

participation of more than 60 percent of pediatric cancer patients in clinical trials worldwide. Vietti's basic science studies of the mechanisms of action of chemotherapy drugs and their development as key components to multi-agent therapy in childhood cancer paved the way for the remarkable increase in survival in childhood cancer from less than 15 percent to about 80 percent over the past four decades. She designed and directed more than 200 clinical trials, published more than 200 research articles, and was the co-author of *Clinical Pediatric Oncology*, a premier text in the field. A 1953 graduate of Baylor College of Medicine in Houston, she arrived at St. Louis Children's Hospital that same year for an internship and residency in pediatrics. After further training in hematology, she returned to Washington University School of Medicine in 1961 as assistant professor of pediatrics, becoming full professor in 1972. She became chief of the pediatric hematology/oncology division in 1970 and remained in that role until 1986. Throughout her career, Vietti played a critical role in the training of dozens of pediatric hematologists/oncologists while also focusing her clinical work and research on soft tissue and bone sarcoma and acute lymphoblastic leukemia. Her scientific accomplishments included the genetic basis of leukemia, the pharmacology of new chemotherapy agents and the long-term effects of chemotherapy in survivors of childhood cancer.



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DON AND MARY HARKNESS, both MD 58, have established an endowed scholarship fund in memory of their daughter, Laurel, with current gifts and a bequest in their estate plan. Laurel Harkness, MD 86, died in 2003.

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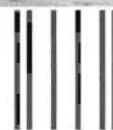


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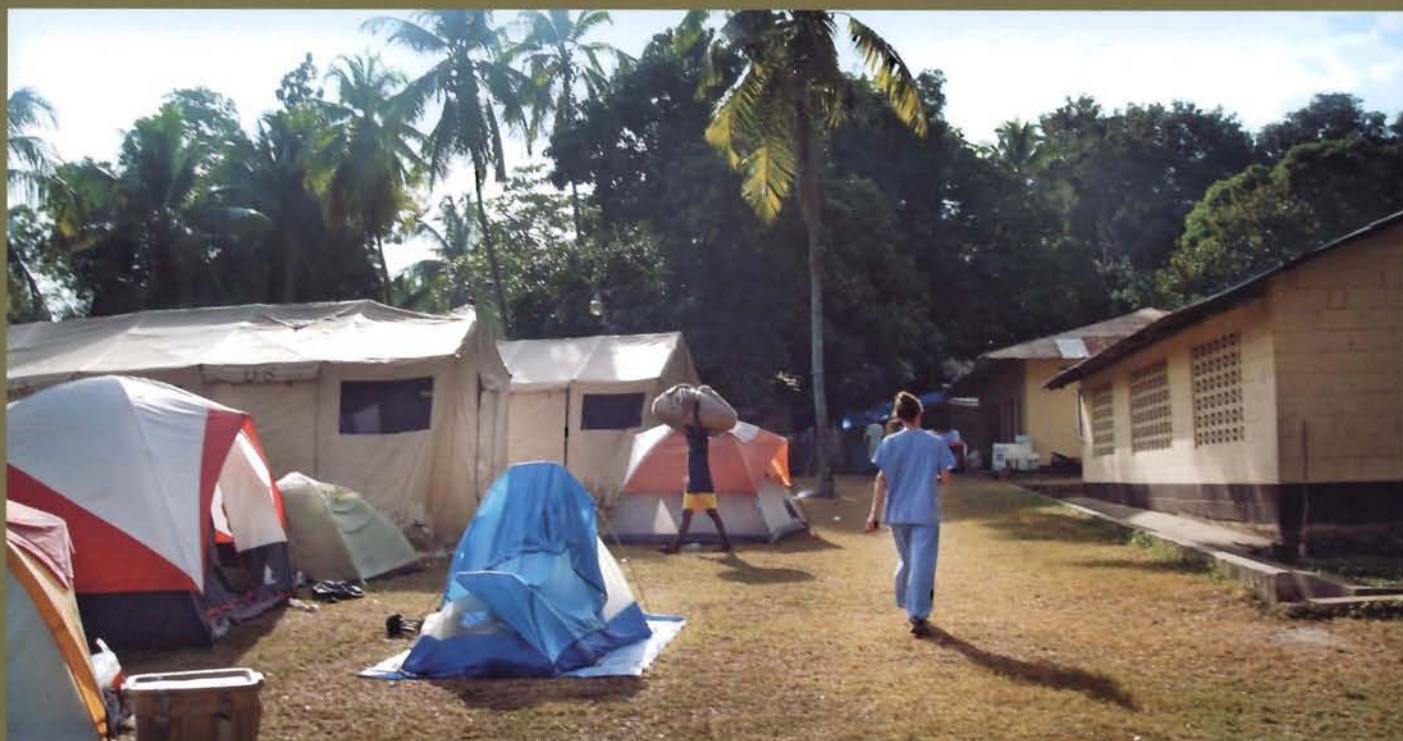


1. Aronson, Rachel
2. Aronson, Nick
3. Aronson, Nick
4. Asel, Mackenzie
5. Avetisyan, Marina
6. Banerjee, Somalee
7. Bettle, Laura
8. Bessica, Licha, Ignacio
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Doodling around All 123 members of the Class of 2013 (names checked off at right) took a turn spinning the Doodletop,[®] a toy that is both a pen and a top, to create a unique piece of art that was included in the Spring 2010 Student/Faculty/Staff Art Show at the Farrell Learning and Teaching Center. According to project co-organizers Mary Clare Masters and Anita Chary: "This work serves as a testament to the spirit of collaboration that we aim to foster as physicians-in-training and in practice: The beauty of the whole is more profound than any single spin, yet the masterpiece is incomplete without each contribution."

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Haiti response This "tent city" served as the residence for Washington University School of Medicine and Barnes-Jewish Hospital emergency medicine residents who traveled to Haiti to provide medical care in the aftermath of its catastrophic January 12 earthquake. The volunteers were able to help thousands of patients in Petit-Goâve, a town 42 miles west of the country's capital of Port-au-Prince and just under 20 miles from the earthquake's epicenter in Leogane. To learn more about their efforts, please turn to page 24.



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